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case of small spherical nebulæ. For from the form of this curve the distribution of luminous intensity in the globular mass may be inferred, which would furnish a valuable clue to the distribution of temperature and density in gaseous nebulæ.

When the source is so small as to be indistinguishable from a star, it would seem that this method is the only one capable of giving reliable information; but even in the case of bodies of larger apparent size it is equally applicable, may be made to give results at least as accurate as could be obtained by photometric measurements, and is far more readily applied.

REPORT MADE TO THE DIRECTOR OF THE ASTRO-
NOMICAL OBSERVATORY OF TACUBAYA, IN
REGARD TO OBSERVATIONS OF THE
ZODIACAL LIGHT.*

The total eclipse of the Sun that took place on the 22d of December, 1889, presented exceptionally good conditions to study the Zodiacial light and crepuscular phenomena, on account of the fact that the zone of totality and its extension crossed our planet in the intertropical regions, where such phenomena take place with greater intensity and under better conditions for their observation; besides, the eclipse occurred at the time when the Zodiacial light shows its greatest extension and brightness. The eclipse began at sunrise for the occidental coast of America, and at sunset for the western coast of Africa. Therefore, the shadow of the Moon touched the Earth at the time when the Zodiacial light is seen distinctly, so that a rare opportunity was offered to the observers, to ascertain with certainty, whether or not the Zodiacial light is produced (at least in part) between the Earth and the Moon, or at a greater distance than that between our planet and its satellite. In order to observe the above-mentioned phenomena Sres. D. CAMILO A. GONZALEZ and D. FELIPE VALLE, of the Astronomical Observatory of Tacubaya, went to Progreso, Yucatan, Mexico.

The observations of the Zodiacial light extended from the 14th to the 25th of December, *i. e.*, seven days before and three days after the day of the eclipse, which took place on the 22d.

* Translated from the *Boletin del Observatorio Astronomico Nacional de Tacubaya*, by
E. J. MOLERA.

There was no difference of any importance in the aspect of the Zodiacal light during the days preceding or following the day of the eclipse, but, "on the 22d, at $5^h 8^m 19^s$ A. M., common time at Progreso (the latitude of which is $21^{\circ} 17' 14''$.3 N., and its longitude, from the Astronomical Observatory at Tacubaya, $38^{\circ} 08'$ E., or $5^h 58^m 38^s$.2 W. of Greenwich), at the moment we were watching with great attention the Zodiacal light, *we saw something like a veil or shadow spread itself over it, and diminish its intensity about one-half.* The phenomenon was noticed by the two observers *independently*, and the impressions that the phenomena made on both, *were identical*. It was due, without doubt, to the cone of shadow of the Moon projected on the matter that reflects the solar light directly, after it is reflected by our own planet. Accordingly, the phenomena took place several minutes before the totality of the eclipse began, as it should do, the matter that reflects the light, and produces the phenomenon being at a distance of many thousands of kilometers from the center of the Earth; the shadow, though lasting only a few moments, was gradual, and moved from the zenith to the horizon, or from west to east, in the exact direction that the march of the intersection of the cone of shadow of the Moon with the Earth followed. The notes of observation were:

December 22d, 1889, $3^h 55^m$ A. M.—The Zodiacal light is distinctly visible between α and β *Libræ* and δ and μ *Leonis*, and possibly as far as θ *Leonis*.

$4^h 49^m$.—It is seen more brilliantly in some places in the region that it occupies, for instance, near ζ *Libræ*, and it is considerably more brilliant than at the horizon.

$5^h 08^m 19^s$.—*The shadow of the Moon is projected over the Zodiacal light, reducing the intensity of its brilliancy one-half.*

$5^h 15^m$.—The most brilliant part of the Zodiacal light is at the extreme occidental side of *Scorpio*.

NOTE ON DARK TRANSITS OF JUPITER'S SATELLITES.

BY JOHN TEBBUTT, F. R. A. S.

I have read with much interest the notices which have appeared in Nos. 10 and 11 of the *Publications A. S. P.* with reference to black transits of *Jupiter's* satellites. I have myself